

# THE ZOOLOGIST

No. 747.—September, 1903.

## REMARKS ON SOME EAST-AFRICAN CHAMELEONS.

BY J. LEONARD MONK.

(PLATE V.)

OUR knowledge of the *Chamæleontidæ* has within recent years been remarkably increased, and is concurrent with the steady progress of the opening up of the vast African continent—the land of hidden wonders—thanks to such intrepid and scientific travellers as Sir Harry Johnston and others, and to such close observers as Boulenger, Tornier, Werner, &c., to the former of whom I am much indebted for the valuable assistance accorded me in the preparation of this paper.

The *Chamæleontidæ* are divided into three genera—namely, *Chamæleon*, *Brookesia*, and *Rhampholeon*—the species ranging in size from the diminutive *R. brachyurus*, of 49 mm., to the gigantic *C. melleri*, of 520 mm., and are equally diverse in form, some assuming most grotesque shapes, which to their natural enemies must be very alarming.

There has been a particularly noteworthy increase in the species recorded from East Africa, and it is an interesting fact that the number from this part of the continent is about the same as is known from Madagascar, which a few years ago was regarded as the land *par excellence* of the Chameleon family.

The following figures will convey at once the progress that

has been made in the study of this group. In the 1887 edition of the 'Natural History Museum Catalogue' there are defined—

- 44 species of *Chamaeleon*.
- 3     ,,     *Brookesia*.
- 2     ,,     *Rhampholeon*.

At the present time there are in this unrivalled collection—

- 60 species of *Chamaeleon*.
- 4     ,,     *Brookesia*.
- 4     ,,     *Rhampholeon*.

Werner,\* in his recent list, gives—

- 73 species of *Chamaeleon*.
- 7     ,,     *Brookesia*.
- 5     ,,     *Rhampholeon*.

There were in 1887 only eight species of East African *Chamaeleons* listed in the Museum Catalogue, and one of *Rhampholeon*; now we have

- 18 species of *Chamaeleon*.
- 3     ,,     *Rhampholeon*.

While the new list already quoted shows

- 26 species of *Chamaeleon*.
- 5     ,,     *Rhampholeon*.

The separation of these animals into species (as in many other groups) requires great care, and it is due to such careful systematists as Mr. Boulenger and Dr. Werner that several have been added which otherwise would probably have been overlooked. There is even now great diversity of opinion among specialists of this group regarding the value of certain characteristics for specific purposes, and it is with these and other interesting features of the East African Chameleons that the writer intends briefly to deal.

We can group the species under several well-marked headings, the first as the *C. gracilis* group, which comprises four species separated mainly by the size of the occipital lobes, and the presence or absence of a tarsal spur.

*C. gracilis*.—Distinct indications of occipital lobes, not movable. Male with tarsal spur.

*C. roperi*.—Occipital lobes well developed, but small, *entirely separated from each other*. No tarsal spur.

\* "Prodromus einer Monographie der Chamaleonten," von Dr. Franz Werner ('Abdruck aus den Zoologischen Jahrbuchern, 1902').

*C. quilensis* (= *parvilobus*, Blgr.).—Occipital lobes larger than *C. gracilis*. Male with tarsal spur.

*C. dilepis*.—Occipital lobes larger than *C. quilensis*, and in contact with each other in the middle. Male with tarsal spur.

It is stated by Werner that he has examined a male *C. roperi* which possesses the tarsal spurs; he therefore, with Boettger, regards it as only a variety of *C. dilepis*. I have, however, examined the five specimens of males in the Museum collection, but could not find one in which the spur is developed. But for this character it would be pardonable to confuse *C. roperi* with either *C. dilepis* or *C. quilensis*, as the configuration of the lobes of *C. roperi* varies considerably, although always conforming to the characteristic of being separated on the median line.

This variation of the occipital lobes is also prevalent in the species *C. quilensis*, as a female specimen labelled as from the Niger has the lobes much as in *C. roperi*, a species believed to be only found in East Africa.

Boettger also considered that the difference in size of the lobes of *C. dilepis* and *C. quilensis* only entitles the latter to rank as a variety of *C. dilepis*. I find, however, that the character is well marked and constant, there being no connecting variations, and I see no reason therefore for not regarding them as distinct species.

The type (*C. isabellinus*), which Günther separated by reason of "the large scutes of the occipital flaps and of the occiput," I am forced to the conclusion is only an extreme variety of *C. dilepis*, on comparing it with the Museum series of the latter (which has been considerably augmented since the describing of *C. isabellinus*). The large scutes of the occipital lobes, to which Günther attaches so much importance, are in three longitudinal rows, and from that number I find among the specimens of *C. dilepis* a complete gradation to the typical form of four, five, and six more or less well-defined rows. The general scaling also is variable, being on some specimens flat and on others tubercular.

*C. lævigatus*, which has been confounded with the West African *C. senegalensis*, is closely related to the species of the first group, but entirely lacks the occipital lobes.

The second group of three species (*C. biteniatus*, *C. ellioti*, *C. hoehneli*) is interesting, as it introduces the question of gular

pouches found in *C. ellioti*, and which is to be mentioned later, for the general variability of outline, height of parietal crest, and of scaling in *C. ellioti* and *C. bitæniatus*. Of the three species, *C. hoehneli* is the most easily distinguished on account of the tubercular nasal protuberance; for this reason therefore it is difficult to understand why Werner should regard it as only a variety of *C. bitæniatus*.

It is worthy of mention here that the Museum collection contains one female specimen of an apparently intermediate form between *C. bitæniatus* and *C. hoehneli*: no rostral appendage, scales tubercular, gular fringe more pronounced than in *C. bitæniatus*, the general form more stumpy than in *C. hoehneli*; it is at present classed as *C. bitæniatus*, but it is likely to prove a new species.

The third group contains most of the species possessing a rostral appendage, fully developed generally in the male, only rarely in the female, in which they are more often represented by incipient protuberances. This condition of things is apparently an interesting parallel to the history of the evolution of horned mammals.

In the first edition of the 'Descent of Man,'\* Darwin stated "as probable that horns of all kinds, even when they are equally developed in the two sexes, were primarily acquired by the male in order to conquer other males, and have been transferred more or less completely to the female"; the subsequent palæontological evidence has tended to confirm this.

Dr. Forsyth Major† has pointed out how the oldest members of the Deer family from the Oligocene were absolutely devoid of antlers, while later, not only did the males possess them, but instances are on record of their occurrence in females, although up to the present day the great majority of females of the *Cervidæ* are, as a rule, devoid of antlers. The two recent species of Giraffe develop horns in both sexes, but in their Tertiary ancestors, the *Samotheriums*, the females were only beginning to develop horns, which primarily were male sexual characters. In the *Bovina* no instance of the occurrence of hornless females in recent wild bovine animals is known. It is clear that this is only

\* Charles Darwin, 'The Descent of Man and Selection in Relation to Sex,' 1871, vol. ii. p. 248.

† Geol. Mag. decade iv. vol. viii. No. 444, p. 241, June, 1901.

a recent acquisition, for Dr. Major has described a female hornless skull of *Bos etruscus* from the Pliocene.

To the evolutionist these facts are full of significance, as showing evident progress in the last chapter of the earth's history and transformation, and progression of the whole species. The *Chamæleontidæ* show several stages in this advancement. In *C. melleri* the transference has been completed, the female possessing the development in as perfect a degree as the male. It has been only partly performed in *C. xenorhinus*, the female possessing only two incipient protuberances; while in *C. fischeri* the horns are not apparent at all in some females, whilst they are present in others.

The form of the rostral appendage varies in its formation both as regards shape and composition.

*C. jacksoni*.—Male with three long conical processes, with an outer segmented horny sheath directed forward and curved upwards; these processes represented in the female by small conical scales.

*C. johnstoni*.—Male with three rostral appendages, not so long as *C. jacksoni*; represented in female by conical scales.

*C. xenorhinus*.—Adult male with two long parallel compressed rostral processes covered with flat scales; represented in female by two small rostral protuberances.

*C. fischeri*.—Adult male with two long compressed rostral processes covered with tubercular scales, slightly diverging; not represented, as a rule, in female. It is a curious fact that they are present in some females.

*C. tavetensis*.—Two scaly rostral processes slightly diverging, and each with a double row of strong serrations dorsally.

*C. melleri*.—The dorsal surface of the snout extended into a compressed scaly appendage, continued into a horny pointed process in both male and female.

*C. spinosus*.—A compressed soft rounded dermal lobe covered with small pointed tubercles.

The fourth group comprises the limited genus *Rhampholeon*, distinguished from the Chameleons proper by the spinose scales on the soles of the feet and bicuspid claws. It is with this group that we can introduce the subject of the pits or pockets. The fact of the occurrence of axillary pits in the *Chamæleontidæ* was

first noticed by F. Mocquard\* in 1893; this character, however, proved to be of no absolute value for specific distinctions, as pointed out by Boulenger in the 'Zoological Record' of the same year. To verify the statement of the latter author, I have examined a series of *C. brevicornis* (about fifty specimens), which is included by Mocquard in a list of those species possessing the pit *distinctly*. It was found to be visible only indistinctly in two or three of them. This character, however, is not developed in the East African Chameleons proper, but is to be found in *R. platyceps* and *R. brachyurus* very distinctly and constantly, both of which have been described since Mocquard's discovery. *R. platyceps* has the additional interesting feature of inguinal pits in both sexes, a character hitherto unnoticed in any Chameleons.

These inguinal pits apparently are different in structure from Mocquard's pits, which are to a great extent formed by the position of the shoulder as applied to the body. In *Rhampholeon* the pits take the character of large pores with small round external openings. An equally interesting character is the gular pocket, which takes the form of a slit-like fold on each side of the gular region, and are unnoticeable unless the folds are pulled apart, appearing externally as the longitudinal ridges found in many other species. My attention was first directed to this on examining the only Museum specimen of *C. goetzii*, before the publishing of Werner's work, who, I find, mentions the character in connection with the protrusion of the tongue. Tornier, the describer of *C. goetzii*, makes no mention of it. The same feature occurs in *C. ellioti* in varying conditions. A female specimen, 94 mm. in length, possesses a pouch measuring 12.5 mm., darkly pigmented. This pigmentation, however, is sometimes only partly present, or wholly absent.

An examination of the twenty-five specimens of *C. ellioti* in the Natural History Museum reveals the following variation :—

	Possessing pouch.	Not possess- ing pouch.	Deeply wrinkled.
Males .....	1	4	5
Females .....	9	6	—

\* C. R. Soc. Philom. 1893.

It would appear from the foregoing that although the character is not sexual, it is adopted by the females much more extensively than by the males, for what reason it is difficult to say; neither is distribution the cause of it occurring as it does in specimens from Mount Ruwenzori, Uganda, and West Ankoli. It is interesting, however, from the fact that we might have here the first stages of a new development in this already highly specialized group.

## LIST OF EAST AFRICAN CHAMELEONS.

*Chamæleon laevigatus.*

- „ *gracilis.*
- „ *quilensis.*
- „ *dilepis.*
- „ *roperi.*
- „ *biteniatus.*
- „ *elliotti.*
- „ *hoehneli.*
- „ *tempeli.*
- „ *goetzii.*
- „ *affinis.*
- „ *tavetensis.*
- „ *xenorhinus.*
- „ *fischeri.*
- „ *fuellborni.*
- „ *weneri.*

*Chamæleon tornieri.*

- „ *quadricornis.*
- „ *pfefferi.*
- „ *deremensis.*
- „ *temporalis.*
- „ *johnstoni.*
- „ *jacksoni.*
- „ *melleri.*
- „ *spinosus.*
- „ *tenuis.*

*Rhampholeon kersteni.*

- „ *brevicaudatus.*
- „ *platyceps.*
- „ *spectrum.*
- „ *robecchii.*

## CAN AND DO BIRDS REASON ?

BY FRANK M. LITTLER, M.A.O.U.

THIS is a subject upon which much has and can be said on both sides. Opponents refuse to believe that any living being other than man is endowed with intelligence. On the other hand, the more liberal minded feel they cannot blind themselves to many facts that come under their notice, which cannot be accounted for except by the supposition of a reasoning capacity. The matter has been dealt with at some length by Wallace and Milne-Edwards; also incidentally by Dr. Carpenter in his great work on 'Mental Physiology.' Unfortunately the writings of the two first authors are not available, so that I am unable to ascertain how far their views correspond with those here expressed.

It is more particularly in regard to nest-building that discussion has been carried on. In the following notes other points will be considered, and an endeavour made to show that something more than "instinct" is possessed by our feathered friends. At the same time "instinct" and "intelligence" merge so into one another as to become almost synonymous terms, and what one would attribute to "instinct" another would contend was "intelligence." Dr. Carpenter\* says:—"It would be impossible to find a better illustration of the contrast between Instinct and Intelligence as springs of action than is afforded by the comparison of the habits of birds in a state of nature with those which they acquire when brought into relation with Man. There can be no reasonable doubt that their architectural constructions, like those of insects, proceed from an inherent impulse, which prompts each individual of a species to build after one particular pattern, to choose a situation suitable to its requirements, and to go in search of materials of a certain kind, though others might be much more easily obtained. But, on the other hand, in the working out of this

\* 'Mental Physiology,' p. 85.

design, it is clear that birds often profit by experience, and learn to use special means when special ends have to be provided for."

In any newly settled country or colony, where environments are constantly changing, there is a wider scope for observations on the intelligence of birds than in any highly and long cultivated area.

Dealing first with nest-building and some of its phases, it has been somewhere remarked that each species (of birds) has built on the same uniform plan from time immemorial. To this it may be answered—Yes, quite so, provided the environment remain unchanged.

The Golden Oriole, in its haunts undisturbed by man and his inventions, constructs a nest of long fibrous vegetable material flexible and strong enough for its purpose; but in localities where man's industry abounds, it borrows such materials as are best suited for its purpose, ignoring those nature has supplied. There is no alteration in the design of the nest, but simply the materials have been changed. This would seem to indicate that some degree of reasoning has been employed. The question arises, how was it that "foreign" material first came to be used? Was it curiosity that impelled the first Golden Oriole to try the strange substances, and, upon finding them so suitable, to communicate the fact to its fellows? I repudiate the idea that it was all a matter of "chance." Here in Tasmania there are at least sixteen species of birds that use "foreign" substances in the construction of their nests. Wool, cowhair, and horsehair are the commonest materials. Naturally there arises the question, what did these birds use prior to the advent of sheep, cattle, and horses, and what caused them to take to wool, cow-, and horsehair? Take one species, for example, the Yellow-rumped Tit (*Acanthiza chrysorrhoa*), whose bulky and globular nest is often almost entirely composed of wool, while to my knowledge one is never found that does not largely consist of this substance; and yet it is not really so long ago since domestic animals were first introduced into this island. The Lesser White-backed Magpie (*Gymnorhina hyperleuca*) constructs its nests of sticks, but sticks become scarce in well-tilled agricultural districts. The first reaper and binders introduced into Tasmania

were bound with wire, and when threshing, the wire from each sheaf was thrown into a heap. In one district only a few giant eucalypts remained in the fields, and as a natural consequence twigs became very scarce. In their plight the Magpies took to building their nests with wire cut from the sheaves. Some years later string binders superseded wire, and the Magpies had to make shift the best way they could. Wire was certainly a "foreign" substance; if the birds had been guided by mere blind "instinct," they would not and could not have come to such a substitute for twigs. The mere fact of their escaping an awkward predicament indicates that they were endowed with something more than "instinct." An English paper stated a few years ago, that at Stoke Newington Priory the use of wire for nests by the Herons was increasing, and that in the preceding spring nine out of sixteen nests were constructed with wire. There are records of other species of birds building with wire, and such like substances, when there was no apparent necessity for it; but in our utter ignorance of the birds' motives we should hesitate before calling such proceedings mere freaks without rhyme or reason. Dr. Carpenter mentions an incident which he terms "a very good example of intelligential modification of the instinctive tendency." The incident\* is:—"A pair of Jackdaws endeavoured to construct their nest in one of the small windows that lighted the spiral staircase of an old church tower. As is usual, however, in such windows, the sill sloped inwards with a considerable inclination, and consequently, there being no level base for the nest, as soon as a few sticks had been laid, and it was beginning to acquire weight, it slid down. This seems to have happened two or three times; nevertheless the birds clung with great pertinacity to the site they had chosen, and at last devised a most ingenious method of overcoming the difficulty. Collecting a large number of sticks, they built up a sort of cone upon the staircase, the summit of which rose to the level of the window-sill, and afforded the requisite support to the nest; this cone was not less than six feet high, and so large at its base as quite to obstruct the passage up the staircase; yet, notwithstanding the large amount of material which it contained, it was known to have been constructed within four or five days. Now,

\* *Loc. cit.* p. 86.

as this was a device quite foreign to the natural habits of the bird, and only hit upon after the repeated failure of its ordinary method of nest-building, the curious adaptation of means to ends which it displayed can scarcely be regarded in any other light than as proceeding from a *design* in the minds of the individuals who executed it."

Just another example of means to an end in nest-building before passing on. In 'Science Gossip' (vol. v. p. 363), Mr. W. W. Midgley contributed a note on a remarkable Song-Thrush's nest. This nest was built in a fir tree (*Pinus cembra*), in a position exposed to the full force of south-westerly winds. It was constructed in the usual fashion plus something extra. "Utilizing the dead stalks of last season's nettles, with bill and claws they had fastened the ends into the nest and round the trunk of the tree, again fastening the other ends into the nest. Still further to guard against the equinoctial gales, they had selected two of the largest stalks, slung them round the trunk at the nodes, about fifteen inches above the nest, and wove the ends into the sides of the nest so as to stay it." The birds had learnt by experience that unless some special precautions were taken their nest would be overturned by the first gale. They were gifted with sufficient intelligence to reason out the best method of averting an almost certain disaster. "If the birds had 'sense' enough to safeguard their nest, why did they not use the same 'sense' and remove to a safer situation?" I hear someone ask. I can only reply that birds much resemble human beings who develop an attachment for some thing or person; this attachment causes them much embarrassment, and compels them to perform certain acts hitherto unthought of. Nevertheless, not for worlds would they break that attachment. Our feathered friends and ourselves have an inexplicable bias in our natures—"pure cussedness" the Americans call it.

Why is it practically impossible to poison town-bred Sparrows? A few young birds sometimes fall victims, but very rarely indeed an old one. Is it "instinct" or "intelligence" that tells them that grain strewn promiscuously on the ground is not safe food? Many may say they have learnt by "experience," which implies they are endowed with something more than the mere blind "instinct," which some would have us believe was

their only possession. Then, again, how is it that birds know when their eggs have been touched, but still remain in the nest? Here, it seems to me, that the something we term "intuition" has been brought to bear. As is well known, the Bower-Birds (*Ptilonorhynchinae*) decorate their "playgrounds" and bowers with all manner of objects; and some species have a *penchant* for leaves, and those of a special kind. An interesting trick was played on one of these birds a short time since in a part of Queensland. All the leaves were removed from the playground, and others closely resembling but of a different variety put in their stead, but on returning shortly afterwards it was found that the bird had thrown out all the leaves put there, replacing them with others of its own choosing. There was no "instinct" about that; it was "intelligence" pure and simple; and it is marvellous to think that a mere bird could have distinguished between the leaves put down and those placed by human agency. The question arises: did the bird really know that its playground had been tampered with, or was the knowledge merely automatic; did it feel (without knowing why) that something was amiss, and righted it without intelligently appreciating the alteration? I cannot answer this, but leave the question to some one more fitted to reply.

I will now refer to an occurrence in which both "instinct" and "intelligence" were apparently at fault. In part iv. vol. ii. of the 'Emu' (the official organ of the Australasian Ornithologists' Union) there appears a note from a Queensland correspondent on an up-country station, relating to a Black and White Fantail (*Rhipidura tricolor*) that had been fighting its own shadow in a window for the past fourteen months, with scarcely a break, from morning to night. Now, if this bird had any powers of reasoning, should it not long ago have found out the futility of continuing to fly against the window-glass? Should not its deductive faculties (however feeble) have shown it the uselessness of wasting time and strength in fighting a shadow? But at the same time should not its "instinct" (we readily admit it being possessed by birds) have told it of its error? I am of opinion it should have instinctively become aware of its foolish action. From the above we get two negatives: first, want of reasoning power (with which we do not feel inclined to credit

the feathered tribe); second, want of instinctive faculty (which we unanimously place to their credit). But, as I have said before, "instinct" and "intelligence" are sometimes so closely related that it is almost impossible to separate them. It would appear that "instinct" is a something that cannot be properly defined. It is related in its action to the sub-conscious mind of the human being. We sometimes say that we "instinctively" feel, or know by "intuition" (which amounts to the same thing), that such and such a thing is going to happen. Yet we cannot give any reasons sufficient to satisfy ourselves or our questioners. Birds build their nests without any instruction in the art, for the simple reason their "instinct" guides and compels them to do so, that is, merely automatic; but it becomes volitional when the environment is changed, also the materials out of which nests can be constructed. It is here that their intelligence comes into play, showing that they are not the mere automatons some people believe them to be. We will say a House Swallow (*Hirundo neoxena*) builds its nest in a certain position; it is wantonly destroyed two or three times, and the bird gives up the attempt, and moves to a safer locality. Some may say it is prompted by its "instinct." Yes, quite so; but at the same time may it not be argued that it learnt or received an impression to the effect that the present locality was safe and the recently vacated one unsafe?

The more the subject is investigated the firmer grows my conviction that animals (such as quadrupeds and birds) which are continually associated with man, altering their habits, &c. (so as to conform with a new environment, or different conditions of living), are possessed of an intelligence and power of reasoning, small and feeble though these may be. The continual warfare waged on them has been instrumental in sharpening their faculties and developing traits that are absent, or, more properly speaking, lying dormant, while in their primitive solitude.

Launceston, Tasmania.

## THE EARLY MORNING AND LATE EVENING SINGING OF SOME BRITISH BIRDS.

BY W. GYNGELL.

*Early morning.*—On or about the 21st of June, for several years past, members of the Scarborough Field Naturalists' Society have joined in an all-night excursion. Leaving the town at about 10.30 p.m., the course usually taken is by fields and lanes to a small reedy mere situated at the corner of a wood which slopes up a steep hill-side to a heather-covered moor. By the mere, the entomologists of the party, when weather permits, indulge in sugaring; whilst those interested in the birds listen to the songs of the Sedge-Warbler (*Acrocephalus phragmitis*), Grasshopper-Warbler (*Locustella naevia*), Little Grebe (*Podiceps fluviatilis*) (whose bubbling "uddl-iddl-uddl-iddl-uddl-iddl" is its song), the croak of the Moorhen (*Gallinula chloropus*), the crake of the Land-Rail (*Crex pratensis*), the plaintive cry of the Lapwing (*Vanellus vulgaris*), the hoot of the Tawny Owl (*Syrnium aluco*), and the curious cry of its hungry young,—all sounds which may be heard throughout the night.

Passing into the wood, the entomologists call our attention to the perfectly audible sound made by night-feeding caterpillars at their work of destruction amongst the leaves of oak and hazel. The walk is then continued up on to the moors, where the chief object of interest is the incessant churring of the Nightjar (*Caprimulgus europæus*), also to be heard all night. Then the party settles down to wait for the coming dawn. But all through the night, if fine, it is just sufficiently light to tell the time by one's watch. At about 1.30 a.m. our chatty party is hushed by the ornithologists, who are eager to catch the first sounds of song birds heralding the dawn. And we have not long to wait. On every occasion the Sky-Lark has been the first bird to sing.

The following time-table of song is the result of the writer's own notes for several years, and gives the earliest record for each species:—

Sky-Lark (*Alauda arvensis*), 1.51 a.m.; Song-Thrush (*Turdus musicus*), 2.9; Redstart (*Ruticilla phœnicurus*), 2.10; Cuckoo

(*Cuculus canorus*), 2.13; Tree-Pipit (*Anthus trivialis*), 2.14; Blackbird (*Turdus merula*), 2.15; Garden-Warbler (*Sylvia hortensis*), 2.20; Willow-Wren (*Phylloscopus trochilus*), 2.25; Blackcap (*Sylvia atricapilla*), 2.26; Robin (*Erithacus rubecula*), 2.29; Wood-Wren (*Phylloscopus sibilatrix*), 2.32; Yellowhammer (*Emberiza citrinella*), 2.37; Wren (*Troglodytes parvulus*), 2.48; Great Titmouse (*Parus major*), 2.57; Whitethroat (*Sylvia cinerea*), 2.58; Chaffinch (*Fringilla cœlebs*), 3.0; Chiffchaff (*Phylloscopus rufus*), 3.0; Corn-Bunting (*Emberiza miliaria*), 3.6; Whinchat (*Pratincola rubetra*), 3.12.

Sunrise at Scarborough, June 21st, 3.26 a.m. As the date of the excursion is at the time when so many species of birds are busily engaged in feeding their young, the songs of some are less frequently heard than they would be a few weeks earlier. This probably accounts for the Mistletoe-Thrush (*Turdus viscivorus*) and a few others not appearing in this list, which the writer hopes to extend in future years by making observations at earlier dates.

*Late evening.* — The following time-table is compiled from notes made by the writer during evening walks near Scarborough in June and July. As it is far from complete, perhaps some other bird-lovers may be induced to extend it:—

Mistletoe-Thrush (*Turdus viscivorus*), 7.15 p.m.; Chiffchaff (*Phylloscopus rufus*), 8.0; Wood-Wren (*P. sibilatrix*), 8.0; Golden-crested Wren (*Regulus cristatus*), 8.5; Linnet (*Acanthis cannabina*), 8.14; Chaffinch (*Fringilla cœlebs*), 8.15; Great Titmouse (*Parus major*), 8.20; Wren (*Troglodytes parvulus*), 8.21; Garden-Warbler (*Sylvia hortensis*), 8.25; Greenfinch (*Ligurinus chloris*), 8.30; Swallow (*Hirundo rustica*), 8.31; Lesser Redpoll (*Acanthis rufescens*), 8.35; Willow-Wren (*Phylloscopus trochilus*), 8.35; Robin (*Erithacus rubecula*), 8.40; Hedge-Sparrow (*Accentor modularis*), 8.40; Meadow-Pipit (*Anthus pratensis*), 8.41; Cuckoo (*Cuculus canorus*), 8.42; Whinchat (*Pratincola rubetra*), 8.43; Lesser Whitethroat (*Sylvia curruca*), 8.45; Yellowhammer (*Emberiza citrinella*), 8.46; Blackcap (*Sylvia atricapilla*), 8.48; Whitethroat (*S. cinerea*), 8.50; Corn-Bunting (*Emberiza miliaria*), 8.50; Sky-Lark (*Alauda arvensis*), 8.52; Blackbird (*Turdus merula*), 9.0; Song-Thrush (*T. musicus*), 9.15.

Sunset at Scarborough, June 21st, 8.31 p.m., where daylight on this day is thirty-one minutes longer than at Greenwich.

## THE ECDYSES OF SNAKES; AS OBSERVED IN BRITISH INDIA.

By R. M. DIXON.

THE skin in Snakes, as in other vertebrates, consists of two layers, namely, a superficial (*ectodermal*) and a deeper (*mesodermal*) layer. These two layers are respectively known as the *epidermis*, or scarf-skin, and the *dermis*, or true skin. The *dermis* is also known as the *derm*, *derma*, *cutis*, or *corium*. In the *epidermis* there are two layers. The outer layer consists of horny cells, and is termed *stratum corneum*, or the horny layer. The inner layer is composed of protoplasmic cells, and is known as *stratum Malpighii*, or the mucous layer. The inner layer always serves as a matrix for the formation of the horny layer, which is periodically cast off as one entire piece. The casting off of the horny layer of the *epidermis*, unaccompanied by organic development, is technically known as *ecdysis*. *Ecdysis* is a simple moulting as in Snakes, and is quite distinct from *metamorphosis*, which is a change in form or structure resulting from development, as in insects. The process of *ecdysis* in Snakes is just the same as what happens in the case of mankind, only human beings "shed their skins" bit by bit, almost every hour, while Snakes shed theirs as one coherent piece at periodical intervals. The moulting of feathers in birds is done on the same principle. The *ecdyses* of Snakes resemble the *ecdyses* of Crustaceans in a remarkable degree. The Common Crayfish (*Astacus fluviatilis*) of Europe has been known to moult its skin several times in the year, and I have noticed the Indian Rock-Lobster (*Palinurus vulgaris*) shed its skin as one entire piece.

In all the *Ophidia*, over the surface of the eye, there is a thin invisible miniature watch-glass-like capsule, which peels off with the horny layer of the *epidermis* when that is shed. When the time to moult the horny layer of the *epidermis* approaches, the Snake looks dull and drowsy. The usual colour of the body

grows dim, and the invisible capsule over the surface of the eye becomes distinctly visible as a thin whitish film. The Snake, when about to cast its horny epidermis, rubs its snout on a hard surface, by which the portions of the horny layer covering the lips are first separated. This being done, the Snake usually looks for a projecting point, on which, by the aid of its glutinous saliva, it manages to fix the portion of the horny epidermis detached from its lower lip, and gently pulls the whole horny layer over inside out so skilfully that frequently not a single break is made in the skin from head to tail.

When the Snake has finished its *ecdysis* it looks bright and lively, and, like a flash of lightning, darts forth from the spot where it has cast off its scaly imprisonment. The newly-cast skin does not preserve the coloration of the Snake, but it retains every minute detail of the scales, shields, plates, and sometimes even the pattern so distinctly, that the species of Snake to which the skin belonged is frequently identified with very little or no difficulty.

The time the Ophidians take to cast the horny layer of their epidermis is indefinite and very variable even in the same species. I have now and then observed that younger Snakes usually cast their epidermis more frequently than older ones, and that in captivity this does not happen so often as when at large. Adolescent and adult Snakes in captivity generally take from one to two months, whereas full-grown and older Snakes take from two to even six months. It is probable that aged Snakes cast their epidermis only once in the year. The interval between two successive moults is regulated as much by the *modus vivendi* as by the age of the individual Snake.

The cast skin is soft, delicate, and beautiful, but very light and fragile. Among the natives of India it is regarded as a sure sign of good luck by the orthodox people, who carefully preserve it as a book-marker. Medicinally, it is believed to be very useful in the treatment of ophthalmia. The newly-cast skin, along with the fruit of the date-palm (*Phoenix dactilifera*), if internally given, is said to be an efficacious remedy in the primary stages of leprosy.

Bombay.

## ON THE NAMES OF THE TWO SPECIES OF SKUA WITH POINTED TAIL-FEATHERS.

BY DR. EINAR LÖNNBERG, C.M.Z.S., &c.

QUESTIONS of nomenclature are often sore points to touch, but I think that most ornithologists will accept the following notes endeavouring to settle the names of the two species of *Skua* characterized by the pointed central tail-feathers. There has long prevailed a great confusion\* in the names of these two species, which seems to still continue. The name *parasiticus* has been used sometimes for the Common *Skua*, at other times for the Long-tailed *Skua*, in accordance with different authorities. The name *parasiticus* is first given by Linnæus. In 'editio decima,' 1758 (p. 136), as well as in 'editio duodecima,' 1766 (p. 226), we find a bird named *Larus parasiticus*, with the following diagnosis: "L. rectricibus duabus intermediis longissimis." These words may be just as well applied to the one as to the other of the two species, for both have the two central tail-feathers prolonged, although in a different degree. As no conclusion can be drawn with certainty from this diagnosis, it remains to be seen whether any other information is given by the author; and this is provided in a most satisfactory manner. When Linnæus described the habits of his *Larus parasiticus*, he used the following characterizing words: "Piscaturæ ineptus (resp. ed. xii. inepta ipsa) agit congenere vomituque ejectum (resp. ed. xii. ut vomitu ab iis ejectum) cibum arripit (resp. arripiat)." It is evident that these words referred to the Common *Skua* and its parasitic habits, and cannot be applied to the Long-tailed *Skua*. But the matter is still further elucidated by the quotations of Linnæus. In the first place, he quotes himself in 'Fauna Suecica,' and in 'It. W.göt.'—that is, 'Wästgöta-Resa'

\* Prof. Newton says, in his valuable work, 'A Dictionary of Birds,' "Their nomenclature is an almost bewildering puzzle."

(Stockholm, 1847); and, in addition, a statement by Nils Gissler ("Anmärkningar om Labben-Sterna, rectricibus maximis nigris Faun. Suec. 129") in 'K. Sv. Vet. Acad. Handl. 1753.' Let us now examine what is communicated in these quotations about this bird. In 'Fauna Suecica,' Linnæus informs us that his "*Sterna rectricibus maximis nigris*" is to be found "in Angermannia,"\* a province of Sweden, in which the Long-tailed Skua is not to be found, and in "Finmarkia et alibi ad mare" (†) As the Long-tailed Skua does not breed on the sea-coast, and is not properly a marine bird, this note cannot probably refer to it. But a still more powerful argument is found in Linnæus's narrative of his 'Wästgöta-Resa,' because he there gives a full account of what he observed with his own eyes at Marstrand, on the west coast of Sweden. I wish I could give even an approximate idea of Linnæus's vivid, expressive, and, at the same time, humorous, style in the following modest translation: "Elof† was here (at Marstrand) the name of the blackish sea-gull that cannot plunge down in the sea itself to catch fish, but is only created a robber among the sea-gulls. One saw with interest how this Cossack pursued the other gulls as soon as they had caught a fish, and did not cease to pursue them till the gull had vomited up the fish he had caught and already packed in. I have seen with astonishment that a tame gull, which I have had several years in the garden of the Academy (Upsala), even if it has got ever so little food, instantly vomited it up if somebody pursued it a little afterwards. This faculty of easily vomiting, the Creator has used for the support of our Elof's family; for, as the gulls often fish more than they ought to, they can easily afford to pay tribute to Swartlasse;‡ but, on the other hand, Nature has so arranged it that Labben§ may not increase too much, and therefore it is also the rarest of all the gulls. To this is added that this Struntjagar|| is not very

\* No doubt he had got this information from Artedi, who had lived in that province.

† The fishermen's name for the Common Skua in Bohuslän, Swedish west coast.

‡ Another Swedish name for the Skua, alluding to its blackish colour.

§ A third Swedish name for the Skua.

|| Another name.

squeamish; for sometimes the gulls must, when they have nothing on the market-place, open the back door and throw at him spoiled food, which he takes for good as well. Swartlasse is very adroit, so that he always catches the food in the air when it is thrown at him by the gull. Nor is he shy, for when the fishermen see him, and cry, 'Elof, Elof,' with outstretched arm, and showing him some little fish, Elof comes flying towards the boat, and catches the fish as soon as it is thrown." . . .

That every word of this description applies to the Common Skua, and not to the Long-tailed, is apparent to everyone who has any knowledge about these birds. The Long-tailed Skua is also not to be found on the Swedish west coast, where Linnæus made these observations, but where the Common Skua is not scarce.

The third of the quotations from 'Systema Naturæ' refers to Nils Gissler's account, as is already mentioned. This conspicuously refers to the Common Skua (*not* the Long-tailed). The following points are conclusive. Gissler mentions the dimorphism of the Skua, although he erroneously believes it to be a sexual dimorphism, and says that the male is more blackish. It can nevertheless not be referred to the Long-tailed Skua,\* for it does not coincide with the information that the bird in question lays its two eggs on the uttermost rocks in the archipelago, while the Long-tailed species in Scandinavia only breeds on the fells of Lapland and adjoining parts. Thereafter Gissler describes the parasitic habits of the bird—how it robs the Gulls, &c.; how rapid and dexterous it is in its flight, and how it can be attracted by the fishermen throwing at it a herring, or some other eatable thing, and so on; all facts referable to the Common Skua, and only to that species, not to the Long-tailed one. These three references are, as already mentioned, quoted in the first place, and are the more important because they are partly Linnæus's own—must have been so thoroughly understood by him—as they were made by a contemporary author about a well-known Swedish bird. When this is so it is perfectly evident that Linnæus, with his *Larus parasiticus*, meant the Common Skua, which he himself had seen,

\* Only one instance of dimorphism being known about the Long-tailed Skua.

studied, and described, and not the Long-tailed Skua, which is not proved to be known to Linnæus, even if some of the *later quotations* in 'Systema Naturæ' should refer to that bird. Besides, and finally, it is almost an insult to the great author to assume that he should have made such a mistake as to name a non-parasitic bird such as the Long-tailed Skua *parasiticus*, when the matter lay within the limits of his own personal experience, as this apparently did.

The name of the Common Skua must therefore stand as *Stercorarius parasiticus* (L.).

It remains now to find out which name for the Long-tailed Skua has priority. Reichenow has recently\* for this bird (at the same time as he, unlike the author of 'Cat. Birds, British Museum,' vol. xxv., correctly accepts the specific name *parasiticus*, L., for the common species) readopted the specific name "*Stercorarius cephus* (Brünn.), 1764." I suppose that Reichenow in this refers to the bird described by Brünnich in his 'Ornithologia Borealis' (Hafniæ, 1764) under the name *Catharacta cephus*. But the whole description of this bird makes it clear that Brünnich had before him not a Long-tailed Skua, but a young specimen of the Common Skua. To prove this the following quotation from the diagnosis need only to be made:—

"Capite colloque luteis fusco longitudinaliter *maculatis*; reliquum corpus ex luteo fuscoque *undulatum*, abdomine pallidiore, macula alari alba, *cauda subæquali*," which is still further elucidated by the full description in the same style. It is just as clear that Brünnich's figure, although badly made, does not represent a Long-tailed Skua.†

*Catarractes parasita* Pallas (Zoogr. Rosso-As. t. ii. pp. 310-11) seems to refer to the Common Skua rather than to the Long-tailed Skua,‡ to judge from the measurements of the tail-feathers, and from the statements: "Alæ . . . compositæ medias rectrices fere æquantes." . . . "*Remiges . . . primariæ rhachibus albis*," as well as from the references and quotations.

\* 'Die Kennzeichen der Vogel Deutschlands,' Neudamm, 1902.

† Brünnich's names *parasitica* and *coprotheres* represent, of course, respectively the light and dark forms of the adult bird *S. parasiticus* (L.).

‡ As is indicated in 'Cat. Birds, British Museum.'

But already (1760) Brisson mentions, in his 'Ornithologia' (t. vi. p. 155), under the name *Stercorarius longicaudus*, a Skua which is said to have its "cauda tredecim pollices longa"; and there can be no doubt that this refers to the Long-tailed Skua, even if the following synonyms (among which *Larus parasiticus*, Linn.) are incorrect. *Longicaudus* must therefore stand as the specific name of the Long-tailed Skua, and it seems quite suitable.

## AN UNKNOWN WARBLER IN OXFORDSHIRE.

BY W. WARDE FOWLER, M.A.

I FEEL that it is incumbent on me to put on record my experience this summer of a bird which I have been entirely unable to identify, even with the help of several persevering young friends, who did all they could to find the nest, and to note the appearance and song. I was unluckily unable to bring any ornithologist of larger knowledge than my own to bear upon the problem; Mr. Howard Saunders was unable to come, and Mr. O. V. Aplin was away from his home in the county. But I cannot help thinking that, without shooting the bird, they would hardly have got further than I did; and, as there was barely a doubt that the bird was breeding, I would not myself take the responsibility of destroying it.

All ornithologists know how difficult, and even impossible, it is to identify our little Warblers with the aid even of strong binoculars, unless we hear them sing, or track them to nest and eggs. Especially is this the case with the tree-haunting Warblers when the foliage is once fully out, and the bird of which I write, with all the restless habits of a *Phylloscopus*, did not appear until the second week in May, and then moved about continually in the higher branches, so that, as a rule, we only saw it from below, and in doubtful lights. But for its voice it would never have attracted attention; but that voice was so striking, and so unique in all my experience in this country or the Continent, that even when I sent a friend with instructions as to where to hear it, being unable to accompany him myself, he recognized it the moment he came within its range. I myself became so thoroughly familiar with it that I should recognize it instantly anywhere on the globe, and I can recall it in imagination with perfect precision, though I cannot attempt to put it down on paper, or in musical notation, any more than I could the song of the Wood-Wren or the Grasshopper-Warbler. It is a sweet,

continuous, liquid gurgle, interrupted here and there by notes—usually three in number—of a more distinctly musical type, which have a certain mellow yet reedy tone, not unlike some of the notes of the Redstart; but these are only given occasionally in the song, which was often continued for half a minute or so, and can only be compared to the noise made by letting a thin thread of water fall somewhat irregularly into a basin with water in it; or it may be imitated by blowing gently, but with varying force, through an egg-blower into a tumbler of water. Thus it has a distant resemblance to the voice of the Grasshopper-Warbler, to that of the Wood-Wren, and also to that of Bonelli's Warbler, and, when I was first on my way to hear it, I had no moral doubt that it would turn out to be one or other of the first two of these, though I nourished a secret hope that it might be Bonelli, a bird well known to me, and one which I have always half expected to hear of in England some day; but no sooner did I have a chance of listening to the song than I was forced to give up all such expectations, and confess myself completely beaten.

It was on June 10th of last year that I was first taken to the spot by Mr. W. S. Medlicott, of Magdalen College, who told me that he had made acquaintance with the bird the year before (1901), and had searched carefully for a nest without success. The wood is very secluded, and I have never seen anyone there except a friendly keeper; the haunt of the bird is the southern edge of the wood, and is limited to a space of about a hundred yards square, within which limits it moves about continually, seldom staying long in any one tree. Perhaps the favourite spot was where a little cowpond at the very edge of the wood was overshadowed by a young oak and some smaller bushes growing out of a thick undergrowth; but it would sometimes retreat some way into the wood itself, which was composed of oaks, elms, ashes, and a few firs, none of them of any great size, with small open grassy spots, admirably suited for ground-building birds.

On June 10th I heard hardly anything of the song; it was the afternoon, when even the most persistent of singers are apt to be silent. I came again alone a week later, and heard enough to make it quite clear to myself that I had never yet come across this singer, but I could not get a good sight of it, and I had to

leave Oxford a day or two later. This year (1903) I heard from Mr. Medlicott, who was not in residence at Oxford, that a friend had reported the bird as returned for the third time, and the next day I spent two hours alone listening and watching, but had to leave the wood entirely mystified. On June 4th I took two young friends with me to look for a nest. In this we failed, as usual, but we learnt a good deal more about the bird; for example, that it shivers its tail slightly when singing, but apparently not its wings, as the Wood-Wren does; that it eats green caterpillars; that it is the size of the Wood-Wren, or rather larger and stouter; and that it has a white throat and a dull white or buffish white breast, the back being, so far as we could see, rather a rufous brown. On the whole, it was rather more like a Garden-Warbler, as seen from below, than a *Phylloscopus*; but its movements were more like those of the Wood-Wren than any other bird. Yet assuredly its song had absolutely nothing in common with that of the Garden-Warbler, and only the most distant resemblance to that of the Wood-Wren. I may say that during our many visits to the wood we never heard the song of the Wood-Wren, nor its peculiar musical call.

On June 17th I went again to look at a nest which had been found by one of my helpful young friends; it was apparently that of a Willow-Wren, but was curiously large and conspicuous, composed chiefly of moss, and lined with Partridge feathers; it contained one egg, of a pinkish white ground colour, with pale red spots all over it. We spent much time on this occasion and afterwards in watching this nest, and the birds belonging to it, but were never able to connect either it or them with the bird we were trying to identify. It was probably the nest of a Willow-Wren. Mr. Aplin, to whom I afterwards showed one of the eggs, did not feel confident about it, and was inclined to lend an ear to my suggestion that it might be *Phylloscopus borealis*; but, as far as I can discover from books, no nest of that species has yet been found with a lining of feathers. As far as the evidence of the nest and eggs is concerned, I cannot attach any weight to it, and, in spite of the most diligent search, we never came upon another that could be in any way connected with our bird.

I spent a long time in the wood on June 24th, and again on the 30th with my friend Mr. H. G. Maurice—still unable to come

to any conclusion, but getting thoroughly familiar with the bird and its ways. A day or two later Mr. Maurice, who was staying in Oxford, bicycled out to the wood at daybreak, and stayed there a long time. He made careful notes on the spot, which he has kindly placed at my disposal. I had myself become disabled by rheumatism and neuritis, the result probably of spending too much time in a damp wood in a very wet season. The general result of Mr. Maurice's observations was to disconnect the bird with the nest we had found, and to suggest another spot as likely; but it was part of our bad luck in the whole business that he too was unwell after a slight sunstroke, and was unable to search as carefully as he wished. His notes made on July 2nd are, however, very interesting, as showing the food and appearance of the bird, and I will quote the most important part of them:—

“I reached the spot about 4.15 a.m., and left it about 6.30 a.m. The bird sang the whole time without interruption. (This is remarkable for so late a date.) At first it was in the trees so much frequented on the occasion of my last three visits, and, though it made brief excursions to other parts, it always returned to this neighbourhood. I beat out the part where I thought I saw the hen last evening, but without result. I had several good looks at the bird, and saw him kill two caterpillars in the manner I observed yesterday (*i. e.* by knocking them against a branch). On the second occasion he was very close to the supposed nest. The caterpillar was a very long and large one, and very light in colour. The process must have lasted certainly one minute, probably a good two minutes. He paused several times, and appeared to try to eat the caterpillar, but found it necessary to resume the threshing process, presumably because the caterpillar curled up and obstructed him. While threshing it, he held the caterpillar by one end, so as to swing it full length. Twice in the course of the battle he paused and sang a short snatch of song, with the caterpillar still in his bill, though, as a rule, he opens his mouth wide in singing. At length, whether by accident or design I cannot say, he dropped the caterpillar. He followed it at once, returned with it to a low branch, and devoured it in the twinkling of an eye. He then sang, and retired singing to his favourite haunt, not appearing to take any interest in our nest, which now contains two young birds.

"My general idea of the bird's colour and shape is much clearer now. I do not believe that with a clear view one could take him for a Chiffchaff or a Willow-Wren. He seems a larger and stouter bird. The general colour of the upper parts is decidedly dark; head dark brown right down to the throat, and I could detect no sign of an eye-streak. The under parts lighter, but suffused with a very decided grey. The general appearance of the bird was to me much more suggestive of the Garden-Warbler than any other bird I know.

"Once, while very near the spot where I thought the nest would be, he descended with a curious fluttering flight, like a falling leaf, into some low elder bushes, but did not remain there long. He returned to them once or twice in the course of the morning, but again did not remain there long. His movements are generally abrupt. The wings as well as the tail quiver while he sings, though less noticeably; the head is thrown back, and turns slightly from side to side, and the mouth is very wide open."

This last observation of Mr. Maurice's, that the head is turned slightly from side to side, is interesting when taken in connection with the song, which is, or seems to be, always gently rising and falling, and does not remain on the same musical plane, if I may use the expression. Probably the effect is produced, as in the case of the Grasshopper-Warbler, by these motions of the head. All that he says of the appearance of the bird coincides closely with the observations of Mr. Medlicott, myself, and others. Last year, when I had but a slight acquaintance with the song, I was inclined to think that this was an eccentric Garden-Warbler, and I thought on one occasion that I heard in the song of that species—or, rather, of a single individual of it—some sibilant notes faintly reminding me of our mysterious bird. This year, however, I have been obliged to abandon this idea; and in any case it would be a most extraordinary circumstance if a Garden-Warbler were to develop a song so entirely different from that of its species in all its main characteristics, and so unique among all British birds. Again, were the bird a Garden-Warbler, why did we fail to find a nest of that species, after moving about so often in the haunt of the bird, and examining every nest in every stage of existence?

Both Wood-Wren and Willow-Wren must be considered out of the question also, if we are to apply to them any of the ordinary tests of identification. Of the latter species there were several close at hand singing their familiar song. As I said at the beginning of this paper, I have never heard anything like the song of this mysterious creature either in England or the Continent. I have searched Dresser's 'Birds of Europe,' and many other works, for some account of a small bird's song which might at all resemble ours; but among the numerous tribes of Warblers I can find none, unless it be *Phylloscopus borealis*, and I cannot honestly say that any description I have read, of the song, or the plumage of that species gives me much encouragement. I am still quite in the dark about the bird which gave me so much interesting employment last June, and must postpone further investigation till June of next year, in hopes that a bird which has already spent three seasons in one particular spot may return for a fourth. Meanwhile, it is possible that some readers of 'The Zoologist,' who have a larger acquaintance than I have with foreign birds and their songs, may be able to contribute some suggestion towards the solution of the problem.

## NOTES AND QUERIES.

## MAMMALIA.

**Natterer's Bat (*Myotis nattereri*) in Bedfordshire.**—During a visit of a few days last year to the village of Turvey, Bedfordshire, I noticed during the evenings several Bats frequenting the garden of the Crown Farm, where I was then staying. Their light-coloured under parts first attracted my attention as to their species, but it was not until Aug. 3rd of the present year that I was able to procure a specimen, which I obtained from a hole in a plum tree (an unusual sleeping haunt, I believe, with this species) near at hand, and so confirmed this new record for that county. — J. STEELE-ELLIOTT (The Manor House, Dowles, Worcestershire).

**Natterer's Bat in Oxfordshire.**—A Natterer's Bat flew in at one of the windows of this house on the night of June 26th, after a hot day. It does not seem to be very uncommon in this county. The last I had was found by some workmen who were repairing the roof (of "Stonesfield slate") of an old house in the village, in April, 1902. A Long-eared Bat was caught at the same time. Messrs. J. G. Millais and H. Noble found Natterer's Bat in company with Daubenton's, the Long-eared, and (one) Bechstein's Bat in a chalk cave near Henley-on-Thames (but in Berkshire) in March, 1901 (P. Z. S. 1901, p. 216). For other Oxfordshire occurrences, cf. 'Zoologist,' 1889, pp. 308 and 381. — O. V. APLIN (Bloxham, Oxon).

**Natterer's Bat in Surrey.**—In July, 1902, I caught a specimen of Natterer's Bat (*Myotis nattereri*) in the room of a house at Milford, Surrey. This may be worth recording, as I believe this species is somewhat local. I ought to have recorded it before, but forgot until the other day, when I came across the skin. — GORDON DALGLIESH (Clairval, Colling's Road, Guernsey).

## AVES.

**Dartford Warbler in Shropshire.**—The occurrence of *Sylvia undata* in this part of England has not hitherto been authenticated, though recorded on slender evidence in Staffordshire. In the autumn of 1902

Mr. J. S. Lang, of Ludlow, noticed a pair of birds in a gorsy bit of country near that town, which he suspected were Dartford Warblers. He found them again in May this year, and they were then very tame, often allowing themselves to be observed at close quarters, enabling him to establish their identity beyond doubt. The male might frequently be seen perched on the topmost spray of a gorse bush. Mr. Lang found there were two pairs in the locality, and subsequently one of the nests was discovered by Mr. J. Palmer, who has eggs. I may add, on the authority of the last-named gentleman, that three pairs of Hobbies again bred near Ludlow this season. — H. E. FORREST (Shrewsbury).

**Nesting Habits of Long-tailed Tit (*Acredula caudata*).**—It does not seem to be generally known that, during incubation at least, both the male and female frequently, if not always, occupy the nest at night together.—J. STEELE-ELLIOTT (The Manor House, Dowles, Worcester-shire).

**Cirl-Bunting in Flintshire.**—On July 29th last, when in company with Mr. T. A. Coward, a male of this species (*Emberiza cirrus*) was seen and heard singing by us at Tremeirchion. This is, I believe, the first record of this bird in Flintshire. It is probable, however, that it occurs in several localities in this county, and also in many places not hitherto recorded in most, if not all, of the counties of North and South Wales. It is undoubtedly overlooked in many instances, notwithstanding its many distinctive characteristics, irrespective of plumage, which distinguishes it from the ubiquitous Yellowhammer.—S. G. CUMMINGS (King's Buildings, Chester).

**Nesting of the Grey Crow in Suffolk.**—This year a pair of Grey Crows (*Corvus cornix*) have nested and reared a brood of young ones at Gunton Old Hall, near Lowestoft, and my informant, E. W. Fowler, Esq., who resides there, writes me as follows:—"I saw five Grey Crows here for some days between the 1st and 15th of June; two appeared to be old ones and three young, and I believe they nested in the wood with the Rooks. The young ones were poor flyers, and I had to tap the tree they were on with my stick to move them, and then they only flew a short distance. I saw one of them as late as the middle of August. Two or three years ago I saw an old Grey Crow here in July." — E. A. BUTLER (Plumton House, Bury St. Edmunds, Suffolk).

**Late Occurrence of Swift and Cuckoo in Scotland.**—*Cypselus apus* has stayed with us later than usual this year. I saw several flying

about over the city of Edinburgh, and uttering their scream, as is their custom, on the evening of August 23rd last. In former years, and much farther south—Kirkcudbrightshire—I found the 20th August a late date for their stay. On this date, in 1894, I saw a group of them on their southward migration. It is true I have also seen a solitary straggler in the first days of September, but this is of course abnormal. When on a holiday in the early summer of this year I heard the Cuckoo's call—practically unbroken—on the opening morning of July. I do not know whether this is in the nature of a record or not, but I never have heard it after the month of June in former years. A certain well-known writer of fiction (Sir Conan Doyle, in 'Rodney Stone') would lead his readers to think that it calls in September. I have not heard it so late myself!—J. W. PAYNE (1, Meadow Place, Edinburgh).

**The Hobby in South Warwickshire.**—A friend of mine in South Warwickshire, not far over the Oxfordshire border, sent me a fine adult Hobby (*Falco subbuteo*) in the flesh on August 15th last, and wrote:—"The keeper shot this in the wood; they build in fir-trees near the pond; there are more there now." Doubtless this remark refers to the other old bird and the young ones reared this year. The bird sent proved to be a female, and measured 13·2 in. in total length; wing, 10·25 in. Legs and feet bright golden- or deep chrome-yellow. Claws blackish horn. Bill horn-colour, paler and greenish at the base of the upper mandible. Cere greenish yellow. Eyelids yellow. The stomach contained fragments of small beetles.—O. V. APLIN (Bloxham, Oxon).

**Albino Moorhens.**—Pure albinism is, I believe, very rare in the Moorhen (*Gallinula chloropus*); the only departures from the normal with which I have hitherto met are pied varieties showing more or less white, and individuals the plumage of which presented a silky or hair-like appearance. Of the latter curious variety there are good descriptions in the 'Birds of Norfolk,' ii. p. 422, and by Mr. Gurney in the 'Transactions of the Norfolk and Norwich Naturalists' Society,' iii. p. 581 (with coloured figure). I was pleased therefore to have an opportunity of examining two fully-grown young ones in beautiful plumage in the shop of Mr. Lowne, of Great Yarmouth, to whom they were sent to be preserved by Mr. Walter J. Corbett, of Rollesby Hall, near that town. They were both females, and were killed at Rollesby about the 1st and 3rd August last. The plumage in each case is pure white, the legs and bills pale chrome-yellow, and the irides pink,

as is usual in albinos; the other members of the same brood, Mr. Lowne was told, were of the normal colour. — THOMAS SOUTHWELL (Norwich).

**A Spotless Curlew's Egg.**—On the 19th of May last I found, in a nest placed in a tuft of rushes in a swamp, three eggs of *Numenius arquata*. All of them were normal in size and shape, and two were of the usual colour, having an olive ground and dark brown and grey blotches, while the third was of a clear bluish green and unspotted. In colour it resembled a Heron's egg. I think this variety must be very rare, and I should much like to know if any of your readers have ever met with one anything like it.—E. A. SWAINSON (Woodside, Brecon).

**Breeding of Lesser Black-backed and Herring-Gulls.**—Would Mr. Elms more clearly define what he means (*ante*, p. 308) by "Lesser Black-back Herring-Gull's nest, containing one egg of the former bird and two of the latter," and his subsequent observations in the next sentences? The difference between the eggs of the two species—darker and lighter, &c.—alone is not sufficient for purposes of identification.—J. A. HARVIE-BROWN (Dunipace, Larbert, Stirlingshire, N.B.).

[In answer to the above query of Mr. Harvie-Brown's—what I meant when making use of the expression "Lesser Black-back = Herring-Gull" was that there seemed a possibility, in this instance, of the nest being common to both species, or, in other words, that these two species were occupying the same nest, which contained one egg of the Lesser Black-backed Gull and two of the Herring-Gull. I quite agree that the colourings and markings of these two birds' eggs are insufficient for the purposes of proper identification, and with such slight evidence as this I would not say that it was by any means an established fact that these two Gulls frequently occupy the same nest. Such a thing may at times happen, and on at least two occasions I met with a nest that tended to point towards such an occurrence. I believe the full clutch of eggs, both for the Herring-Gull and the Lesser Black-backed Gull, is generally admitted to be three eggs, and all the nests I saw, save the one quoted above, contained two only. I trust this reply gives the information required.]

I read the Rev. Holroyd Mills's letter (*ante*, p. 317) with much interest, and hasten to say that I did not see the Lesser Black-backed Gull and Herring-Gull "sitting side by side on one nest." I fear that the evidence is not sufficiently substantial to allow of its being a fact that these birds do habitually occupy a common nest; that birds do so from mischance—perhaps more often than we are aware—admits of no doubt, and Mr. Holroyd Mills furnishes us with an interesting

instance of the same thing with regard to a Mallard's nest containing one egg of the Red-breasted Merganser.—E. F. M. ELMS.]

Sabine's Gull in Yorkshire. — Mr. Machin, the Bridlington bird-stuffer, tells me that on Sept. 1st an adult Sabine's Gull (*Xema sabini*) in winter plumage was brought in for his inspection. This bird appears now to be an annual visitant to the east coast.—JULIAN G. TUCK (3, The Crescent, Bridlington).

Ornithological Notes from Aberdeen for August, 1903.—General feature of this season is late nesting. Swallows (*Hirundo rustica*) with young in nest, Aug. 7th; still here, Aug. 31st. I am quite convinced of having seen two young Cuckoos (*Cuculus canorus*) on Aug. 7th, but did not see both at one time. They were newly fledged and chirping, as well as closely attended by the usual foster-parents. One seen again on Aug. 16th in normal plumage, which shows that this bird had been in a similar position this year to many others, but exhibiting more persistence in breeding than we would have credited it with a month ago. By keen observation the plumage was seen to incline to slate-colour. Curlew (*Numenius arquata*) last heard on Aug. 17th. Dunlins (*Tringa alpina*) have disappeared during the month. Yellow-hammer (*Emberiza citrinella*) hatched two young on Aug. 1st from two eggs. The young seemed to be doing well.—W. WILSON (Alford, Aberdeen, N.B.).

Notes from Bridlington, Yorkshire.—While spending the month of August at Bridlington, I had several opportunities of visiting the Rempton cliffs. The close-time for this district is now extended to Sept. 1st, which gives the birds a fair chance of taking away their young, as on the last day of August there was hardly a bird to be seen on the cliffs, with the exception of a few Guillemots in charge of young ones. Razorbills seem rather scarce, as in five visits to the cliffs I could not recognize one, though I have seen them on the water from a sailing-boat; but there were plenty of Puffins and Kittiwakes, and early in August multitudes of Guillemots. Sandwich Terns appeared in the bay here about mid-August, no doubt some of the Farne Island birds on migration, and other birds I have noticed were a fine old Gannet, several Cormorants, a few Scoters, all the six species of Gull which breed in Great Britain, Kestrels, Carrion-Crows, and Rock-Doves. The Doves are a very mixed lot, some of them almost white. The Gulls here are very tame and amusing, coming quite close to the piers and the spa, and a flock may nearly always be seen at the outlet of one of the sewers, where they will allow a boat to be rowed nearly

up to them. There seems still to be a demand for sea-birds in some milliners' shops, as the following advertisement from an address in Essex recently appeared several times in a Yorkshire daily paper: "Wanted, small sea-birds; 1000 skins immediately; cash"; but the extension of the close-time will be the means of saving hundreds of Terns, though it is to be feared that a good many were slaughtered on this coast early in September, as some gunners were "out on the First" by daybreak. Both in East and West Suffolk some birds are protected by the County Councils all the year through, and a similar order forbidding the killing of "Terns or Sea-Swallows of all species" and Kittiwakes on the Yorkshire coast would be an excellent thing, as readers of this Journal would have thought, had they seen the proceedings of two men in a rowing-boat near this town. I must admit that nothing would have given me greater satisfaction than to have heard that one of them had shot the other, a state of things which seemed quite possible.—JULIAN G. TUCK (3, The Crescent, Bridlington).

#### PISCES.

Megrim and some other Fishes at Yarmouth.—On July 23rd I received from a fish-hawker a small flat-fish, which I identified as the Megrim (*Arnoglossus laterna*); it measured 4 in. in length. This is, as far as I can ascertain, the first example of Megrim brought into Yarmouth—at any rate, recognized. A great many fine Eels have lately been taken both by net and hook at the entrance of the harbour. An Eel was recently caught by a "pick," which, on being opened, was found to contain two lesser Eels almost half as long as itself. I observed a Common Gull (*Larus canus*) pick up a live 12-inch Eel and swallow it, but its squirmings, which could be distinctly seen, made the bird very uneasy, if not a bit frightened; but it held on, and in about five minutes the squirmings had ceased. A large "grey" Gull adroitly captured a large Eel, upwards of a pound in weight, but was glad almost immediately to let it go again. Eels have been gorging themselves on Shore-crabs (*Carcinus mænas*). When caught they are usually full of them. One, however, lately taken, had several Sand-lances in its maw. On June 19th I obtained a Lemon Sole (*Solea lascaris*), 8½ in. in length.—A. PATTERSON (Ibis House, Great Yarmouth).

[The Megrim is reported by Howse as taken on the Yorkshire coast, but rare. Sometimes brought into the Tyne by the trawlers ('Cat. Fishes, Rivers and Coast Northumb. and Durham and the adjacent Sea').—ED.]

## ACARINA.

IN 1871 I observed and drew the ventral surface of a water mite.\* At the breeding season the ends of the third pair of legs in the male become inflated, and are kept in the genital orifice. When he embraces the female he inserts the germinal fluid with the third pair of legs, using them like chop-sticks. No doubt this has been noticed since, but I doubt if in any book, or even paper, on mites, or I must have heard of it. There is a mite here parasitic on a Honey-eater (*Prothemadera novæ-zealandica*), which has, in the male, claspers to seize the female with. It is unlawful to shoot this bird, but sometimes one can. The mites come and drink at the bird's eyes.—W. F. HOWLETT (75, Ingestre Street, Wellington, New Zealand).

\* Probably one of the *Hydrachnidæ*.—ED.

## NOTICES OF NEW BOOKS.

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*The Birds of Tennyson.* By WATKIN WATKINS, B.A. Cantab.  
R. H. Porter.

WAS Tennyson an ornithologist? In the usual or strict sense of the term we may gladly say—no; had he really deserved that title he would probably not have been the great Victorian poet. That he was a lover of birds, and a good observer of them as he was of other natural creatures and objects, “goes without saying” to anyone who is really conversant with the Tennysonian literature. Mr. Watkins perhaps inclines to over-accentuate Tennyson’s ornithological standpoint. There is the naturalistic poet and the poetic naturalist, but this is nearly all that can be said. It is reported that Karl Schimper, in a small piece of poetry, for the first time used the word *Eiszeit* (glacial epoch).

But is poetry expected to give us facts, or ideas? Is the poet to describe or to idealize a bird? We incline to the latter hypothesis. Of course a want of ordinary familiarity with birds may cause a point to be altogether missed, as with Milton and the Sky-Lark, in the well-known lines:—

“Then to come, in spite of sorrow,  
And at my window bid good morrow.”

On the other hand, some of the highest flights in true poesy have occurred in the idealization of animal life. In the great Semitic epic, described by Tennyson himself as “the greatest poem whether of ancient or modern times,” Jahveh, in addressing Job, speaks of the war-horse in well-known pregnant lines, one of which has been rendered by Carlyle as “he laughs at the shaking of the spear,” words which, certainly, can by no twist be made by any enthusiastic mammalogist to imply a knowledge of the *Equidæ*. When we enjoy a beautiful sonnet, such as Eugene

Lee-Hamilton's "Sea-Shell Murmurs," is it necessary to ask whether the writer was acquainted with the Mollusca? Would any botanist adversely criticize those exquisite lines which have come to us from the ages, and will go down with them: "Consider the lilies of the field, how they grow; they toil not, neither do they spin"?

We prefer to make our standpoint clear in noticing this excellent and conscientious compilation of the bird-lore of Tennyson, which is a complete ornithological concordance to the works of the most read and best loved English poet. But the poet is always greater than his facts; the "Merman," "Mermaid," and "Talking Oak" are strictly outside the canons of biology, and so we may thankfully say is all poetry. It may seem irony for a zoologist to seek to defend poetry from the claims of his own science, but, though the poet ceases to be one when he is untrue to nature, he is still outside all the ologies.

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*The Norfolk Broads.* By WILLIAM A. DUTT and other Contributors. Methuen & Co.

BROADLAND is alike loved by the naturalist, angler, and boating tourist, though the increased visits of the last have proved anything but an unmixed pleasure to the first; the broads are rapidly becoming holiday resorts, and certain riparian owners have asserted their most unpopular rights and privileges. How a Thoreau would have enjoyed and described these glorious meres, whose fauna, alas! is not now what the old-time Broadland marshmen so well remember. Who can forget the birds, the plants, or the big Bream of these winter, perhaps, but now no longer summer, solitudes. No one book can exhaust the tale that the Broadland naturalist can unfold, and we have long wondered why some wealthy naturalist, associated with one of our mighty publishers, has not before this commenced to publish a large fully illustrated folio work on the fauna and flora of this region. It is worth doing, and the men are now living in Norfolk who could write it. It is no disparagement of Mr. Dutt's excellent and beautifully illustrated volume to say this; it is, on the contrary, the perusal of this, the best book up to date

on the subject, that has re-incited the craving for a work that would be beyond the means of the general public, and could only appear by the aid of wealth and interested subscribers. What Godman has done for Central America might well be imitated—a very much smaller undertaking—by some lover of Broadland.

Mr. Dutt, in his volume, takes us through the rivers and broads, tells us what to see, and gives us much information and local lore which can only be gathered by personal experience. Some of the faunistic contributors are well known to the readers of 'The Zoologist.' Mr. A. Patterson writes on the "Wild Life of Breydon," a subject quite his own; the Rev. M. C. H. Bird deals with "Bird Life"; Claude Morley, with Entomology; H. E. Hurrell discusses "Pond Life"; and Botany is treated by the Rev. G. H. Harris. The angler and wildfowler are catered for by A. J. Rudd and Nicholas Everitt.

We are glad to find in this volume a few bionomical facts relative to the fishes of the Broads. It is strange how little we know on this subject. Among the multitude of anglers there seems scarcely an observation made, apart from the best time and way, to hook and land the prey. What is the reason why ornithologists and entomologists still bear the heat and burden of the observational day? while there is absolutely more bionomical information obtainable about our marine than our fresh-water fishes. Much information is acquired that is never garnered. The despised birdcatcher may relate a few of his observations to a mate in an alehouse, but his knowledge dies with him. Mr. Dutt remarks on the same waste with the broadsmen. "Their methods of gaining a livelihood made them close observers of the habits of fish, bird, and beast; the knowledge of natural history that was lost when an aged broadsman died would, if it had been printed, have made his name famous."

We heartily commend this book to all who can feel an interest in an unique aspect of our "rough island-story," and to those naturalists who love the details of a local fauna.

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*Fasciculi Malayenses: Anthropological and Zoological Results of an Expedition to Perak and the Siamese Malay States, 1901-1902, undertaken by NELSON ANNANDALE and HERBERT C. ROBINSON. Anthropology, Part I. University Press of Liverpool.*

It was once well said that, thanks to the researches of a few eminent men, we have a far clearer knowledge of the primitive Aryans than we have of certain states of society actually existing at the moment in Africa and Asia. But this reproach to anthropological investigation is now being rapidly removed. We recently drew attention to a work on the Andamans and Nicobars, in which the veil was lifted from the mysterious race who inhabited the interior of the Great Nicobar. A similar service in this publication is done for the Semang and Sakai tribes which inhabit the Malay Peninsula. We do not say that Messrs. Annandale and Robinson are alone among modern writers on these people, but we can safely affirm that they have produced and will continue the publication of by far the fullest and most authentic account of them. It is remarkable how little was really known, anthropologically, concerning these tribes, and our ignorance was partly due to the few travellers who were interested in the investigation, and the then lack of scientific method in the few actual studies made. Thirty-five years ago, when the writer of this notice resided for two years in the Malay Peninsula, nothing but hearsay and tradition could be gleaned concerning the Semang and Sakai tribes; now we possess the first instalment of a really exhaustive memoir, beautifully illustrated, and conforming to the rigid requirements of anthropological research.

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*The Butterflies and Moths of Europe.* By W. F. KIRBY,  
F.L.S., &c. Cassell & Co., Ltd.

IN our last volume attention was drawn to the commencement of this publication, and we have now received part xxxii., concluding the work. Mr. Kirby, in 1882, published a similar work, in which all the species were described that were included in the catalogue of Staudinger and Wocke (1871); the present volume comprises descriptions of all the butterflies and larger moths

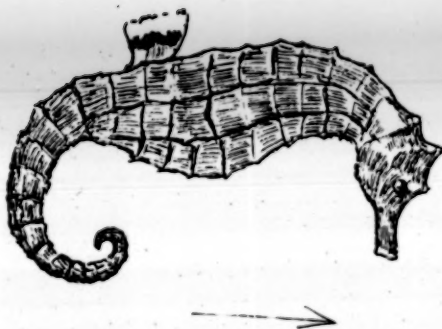
enumerated in the great catalogue of Palæarctic Lepidoptera published by Staudinger and Rebel in 1901. His older work has also been completely revised, and the few species found in Madeira and the Canary Islands, but not met with on the Continent of Europe, have also been included. Mr. Kirby has thus provided a most useful and beautifully illustrated work for continental tourists, and those who pass the winter in the Atlantic islands, and being written in our own language, and provided with so many excellent figures, is likely to prove a standard work on the subject for many years to come.

Although the book is intended to be a popular one, and not beyond the intellectual capacity of the ordinary reader, and is, as far as possible, free from scientific technicalities, it has still avoided the offence of being only composed for the "man in the street." The lepidopterist will find many references to descriptions of larvæ which are little known or have been generally overlooked, for our author is a well-known entomological bibliophile, and is particularly at home in the literature of his subject, both in its modern and more ancient aspects.





Movement in vertical plane.  
Tail slightly flexed.



Movement in horizontal plane.  
Tail strongly flexed.



At rest on floor of tank. Body bent  
into an S-shape.

CHARACTERISTIC ATTITUDES OF THE COMMON "SEA-HORSE" (*Hippocampus antiquorum*), FROM EXAMPLES IN THE AMSTERDAM AQUARIUM.